

WHAT IS CLAIMED IS:

1. A method for identifying a TRIP13 gene modulating agent, comprising:
  - (a) contacting a test compound with a cell that expresses a TRIP 13 gene; and
  - (b) determining a change in expression of said gene as a result of said contacting, wherein a change in said determined expression indicates gene modulation,  
thereby identifying said test compound as a gene modulating agent.
- 10 2. The method of claim 1 wherein said change in expression is a decrease in expression.
- 15 3. The method of claim 2 wherein said decrease in expression is a decrease in copy number of the gene.
4. The method of claim 1 wherein said TRIP13 gene corresponds to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6.
- 20 5. The method of claim 1 wherein said gene comprises a nucleotide sequence that is a splice variant of TRIP13.
- 25 6. The method of claim 1 wherein the cell expressing said gene is a recombinant cell engineered to express a splice variant of TRIP13.
7. The method of claim 1 wherein said change in expression is a decrease in the synthesis of an RNA encoded by said gene.
- 30 8. The method of claim 1 wherein said change in expression is a decrease in the synthesis of a polypeptide encoded by said gene.

9. The method of claim 8 wherein said polypeptide is a member selected from the group consisting of the polypeptides having amino acid sequence of SEQ ID NO: 7-11.

5        10. A method for identifying an anti-neoplastic agent comprising contacting a cancerous cell with a compound found to have gene modulating activity in the method of claim 1 under conditions promoting the growth of said cell and detecting a change in the activity of said cancerous cell.

10        11. The method of claim 10 wherein said change in activity is a decrease in the rate of replication of said cancerous cell.

12. The method of claim 10 wherein said change in activity is a decrease in the total number of progeny cells that can be produced by said cancerous cell.

15        13. The method of claim 10 wherein said change in activity is a decrease in the number of times said cancerous cell can replicate.

20        14. The method of claim 10 wherein said change in activity is the death of said cancerous cell.

15. The method of claim 10 wherein said cancerous cell is a recombinant cell.

25        16. A method for detecting the cancerous status of a cell, comprising detecting elevated expression in said cell of at least one gene corresponding to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6 whereby such elevated expression is indicative of cancerous status of the cell.

30        17. The method of claim 16 wherein said elevated expression is an elevated copy number of the gene.

18. The method of claim 16 wherein the gene comprises a sequence of SEQ ID NO: 1-6.

5        19. A method for detecting a cancer-linked gene comprising the steps of contacting a compound that decreases expression of a gene corresponding to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6, or that encodes a polypeptide having an amino acid sequence of SEQ ID NO: 7-11, with a cell containing a gene to be tested and detecting a decrease in 10 expression of said test gene thereby identifying said gene as a cancer-linked gene.

20. The method of claim 19 wherein the gene comprises a sequence of SEQ ID NO: 1-6.

15        21. A method for identifying an agent that modulates a TRIP13 polypeptide biological activity, comprising:  
                  (a) contacting a test compound with a TRIP13 polypeptide; and  
                  (b) determining a change in biological activity of said TRIP13 polypeptide 20 as a result of said contacting,  
                  wherein a change in said biological activity indicates modulation of TRIP13 biological activity,  
                  thereby identifying said test compound as an agent that modulates TRIP13 biological activity.

25        22. The method of claim 21 wherein said determined change is a decrease in biological activity.

30        23. The method of claim 21 wherein said TRIP13 polypeptide is present in a cell.

24. The method of claim 23 wherein said cell is a mammalian cell.

25. The method of claim 23 wherein said cell has been engineered to contain a TRIP13 polypeptide.
26. The method of claim 21 wherein said TRIP13 polypeptide comprises 5 an amino acid sequence selected from SEQ ID NO: 7, 8, 9, 10, 11 and 12.
27. The method of claim 21 wherein said TRIP13 polypeptide is immobilized on a solid support.
- 10 28. A method for detecting cancer or a disposition toward developing cancer comprising detecting in a sample from a patient an increase in expression of a gene corresponding to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6 or that encodes a polypeptide having an amino acid sequence of SEQ ID NO: 7-11.
- 15 29. The method of claim 28 wherein said increase in expression is an increase in copy number of the gene.
- 20 30. The method of claim 28 wherein said gene comprises a nucleotide sequence of SEQ ID NO: 1-6.
- 25 31. A method for treating cancer comprising contacting a cancerous cell with an agent first identified as having gene modulating activity using the method of claim 1 and in an amount effective to cause a reduction in cancerous activity of said cell.
- 30 32. The method of claim 31 wherein said cancerous cell is contacted *in vivo*.
33. The method of claim 31 wherein said reduction in cancerous activity is a decrease in the rate of proliferation of said cancerous cell.

34. The method of claim 31 wherein said reduction in cancerous activity is the death of said cancerous cell.

35. The method of claim 31 wherein said cancer is a cancer of breast,  
5 colon, lung or prostate tissues.

36. A method for treating cancer comprising contacting a cancerous cell with an agent having affinity for an expression product of a gene corresponding to a polynucleotide comprising a nucleotide sequence of SEQ ID NO: 1-6 in an  
10 amount effective to cause a reduction in cancerous activity of said cell.

37. The method of claim 36 wherein said expression product is a polypeptide.

15 38. The method of claim 37 wherein said polypeptide comprises an amino acid sequence of SEQ ID NO: 7-11.

39. The method of claim 36 wherein said agent is an antibody.

20 40. A method for monitoring the progress of cancer therapy in a patient comprising monitoring in a patient undergoing cancer therapy the expression of a gene corresponding to a polynucleotide having a sequence of SEQ ID NO: 1-6 wherein a decrease in said expression is indicative of success of said cancer therapy.

25 41. The method of claim 40 wherein said gene comprises a sequence of SEQ ID NO: 1-6.

30 42. The method of claim 40 wherein said cancer therapy is chemotherapy.

43. The method of claim 40 wherein said cancer is a solid tumor, or a cancer of breast, colon, lung or prostate tissues.

44. A method for determining the likelihood of success of cancer therapy 5 in a patient, comprising monitoring in a patient undergoing cancer therapy the expression of a gene corresponding to a polynucleotide, having a sequence of SEQ ID NO: 1-6 wherein a decrease in said expression prior to completion of said cancer therapy is indicative of a likelihood of success of said cancer therapy.

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45. The method of claim 44 wherein said gene comprises a sequence of SEQ ID NO: 1-6.

46. A method for producing test data with respect to the anti-neoplastic 15 activity of a compound comprising:

(a) contacting a compound with a cell that expresses at least one gene corresponding to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6 or that encodes a polypeptide having an amino acid sequence selected from SEQ ID NO: 7-11; and

20 (b) determining a change in expression of said gene compared to expression when said contacting does not occur,

(c) producing test data with respect to the gene modulating activity of said compound based on a change in the expression of the determined gene, or genes, whose expression is otherwise elevated in a non-cancerous cell over 25 that in a cancerous cell and a decrease in the expression of the determined gene, or genes whose expression is otherwise increased in a cancerous cell over that in a non-cancerous cell indicating anti-neoplastic activity.

47. A method for determining the progress of a treatment for cancer in a 30 patient afflicted therewith, following commencement of a cancer treatment on said patient, comprising:

(a) determining in said patient a change in expression of one or more genes corresponding to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6 or that encodes a sequence selected from SEQ ID NO: 7-11 and under conditions promoting said expression; and

5 (b) determining a change in expression of said gene compared to expression of said one or more determined genes prior to commencement of said cancer treatment;  
thereby determining the progress of said treatment.

10 48. The method of claim 47 wherein the change in expression determined in (b) is a change in expression of more than one such gene.

49. The method of claim 45 wherein said production of a polypeptide is determined using an antibody that binds to said polypeptide.

15 50. The method of claim 47 wherein said antibody is specific for a polypeptide having an amino acid sequence of SEQ ID NO: 7-11.

20 51. A method for determining survival prognosis of a patient afflicted with cancer, comprising determining in said patient a change in expression of a TRIP13 gene versus a person not so afflicted wherein amplification of TRIP13 in said patient indicates a poor prognosis for survival of said patient.

52. The method of claim 51 wherein said cancer is breast cancer.

25 53. The method of claim 51 wherein said TRIP13 gene corresponds to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6 or that encodes a polypeptide having an amino acid sequence of SEQ ID NO: 7-11.

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54. A method for determining the likelihood of survival of a patient afflicted with cancer, following commencement of a cancer treatment on said patient, comprising determining in said patient a change in expression of a TRIP13 gene following an anti-cancer treatment compared to such expression 5 prior to commencement of said treatment, wherein a decrease in expression indicates likelihood of survival.

55. The method of claim 54 wherein said cancer is breast cancer.

10 56. The method of claim 54 wherein said TRIP13 corresponds to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6 or that encodes a polypeptide having an amino acid sequence of SEQ ID NO: 7- 11

15 57. A method for diagnosing cancer comprising contacting a cancerous cell with an agent having affinity for an expression product of a TRIP13 gene in an amount effective to cause a reduction in cancerous activity of said cell.

20 58. The method of claim 57 wherein said agent is an antibody.

59. The method of claim 57 wherein said TRIP13 gene corresponds to a polynucleotide comprising a nucleotide sequence selected from SEQ ID NO: 1-6 or that encodes a polypeptide having an amino acid sequence of SEQ ID NO: 7- 11

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